Activity 5

Acting on Information About Cancer

At a Glance

Focus: Students assume the roles of federal legislators and explore several CD-ROM-based resources to identify reasons to support or oppose a proposed statute that would require individuals under the age of 18 to wear protective clothing when outdoors.

Major Concepts: We can use our understanding of the science of cancer to improve personal and public health. Translating our understanding of science into public policy can raise a variety of issues, such as the degree to which society should govern the health practices of individuals. Such issues often involve a tension between the values of preserving personal and public health and preserving individual freedom and autonomy.

Objectives: After completing this activity, students will

- understand that science can help us improve personal and public health,
- be able to explain that good choices can reduce an individual's risk of developing cancer and can improve an individual's chance of survival if he or she does develop it,
- understand that ethics brings to public policy debates two presumptions: that we should protect individual autonomy and that we should protect individual and societal health and well-being,
- recognize that ethical values sometimes conflict in public policy debates about strategies for reducing the risk of cancer, and
- understand that it is possible for people to hold different positions on a controversial topic and still participate in a reasoned discussion about it.

Prerequisite Knowledge: Students should understand that cancer is a disease involving uncontrolled cell division that results from mutations in genes that regulate the cell cycle. They also should understand that the genetic damage that leads to cancer accumulates across time and that exposure to agents that damage DNA can increase an individual's risk of developing cancer.

Basic Science-Public Health Connection: This activity helps students recognize that the results of scientific research can provide support for or against statutes intended to protect personal and public health.

Introduction

Approximately 1 million new cases of basal cell or squamous cell skin cancers are reported each year in the United States, and approximately 40,000 new cases of melanoma also are reported. These cancers are most common among individuals with lightly pigmented skin. Risk factors for skin cancer include excessive exposure to ultraviolet (UV) radiation, fair complexion, and occupational exposure to substances such as coal tar, creosote, arsenic compounds, and radium.

The relationship between excessive exposure to UV light and skin cancer suggests that many cases of skin cancer could be prevented by protecting skin as much as possible when outdoors. In this activity, students consider the reasons to support or oppose a proposed federal statute that would require all individuals under the age of 18 to wear headgear and clothing that covers 90 percent of their extremities while outside during peak hours of UV exposure. Discussing the relative merits of this statute offers students the opportunity to discover that one difficulty in developing public policy is that any single policy typically advances one set of interests over another. For example, enacting the statute about mandatory protective clothing advances the value of individual and societal health and well-being at the expense of the value of personal autonomy.

Materials and Preparation

You will need to prepare the following materials before conducting this activity:

- Master 5.1, *A Proposed Statute* (make 1 copy per student)
- Master 5.2, *Getting Prepared to Support or Oppose the Statute* (make 1 copy per student)
- Master 5.3, *Analyzing the Results of a Public Policy Discussion* (make 1 copy per student)
- *Cell Biology and Cancer* CD-ROM (1 per team)

Follow the instructions on pages 28–29 to load the CD-ROMs onto the computers students will use.

Note to teachers: If you do not have enough computers equipped with CD-ROM drives to conduct this activity, you can use the print-based alternative. To view and print the instructions and masters for this alternate activity, load the CD onto a computer and click the Print button on the main menu screen. The computer will display a screen showing the resources available for printing from the CD; click on the button labeled Non-CD Lesson Plan from the choices available for Activity 5, *Acting on Information About Cancer*. This will reveal the lesson plan and the masters for the alternate, non-CD-based lesson. Click Print again to print these resources.

Procedure

1. **Explain that in this activity, the students will act as elected federal legislators and members of a special committee. The committee will study the feasibility of enacting legislation to reduce the incidence of skin cancer among U.S. citizens.**

   Tip from the field test. Another way to begin the activity is to ask the students how many think they are "open-minded" and, after they have responded, to ask them what it means to be open-minded. Use probing questions to elicit the idea that being open-minded does not mean accepting all arguments or ideas as being equally valid. It *does* mean being willing to listen to and consider arguments and ideas that are different from one's own. After this discussion, introduce the activity as described in Step 1.

2. **Distribute one copy of Master 5.1, *A Proposed Statute,* to each student and ask students to organize into their teams to read and discuss the statute.**

   Initially, students may respond negatively to the statute. We recommend you not challenge this response directly, but answer with something like, "Okay, I hear your concerns. But before you decide, you should learn something about skin cancer and why this legislation has been proposed."

3. **Assign equal numbers of "pro" and "con" teams to identify reasons to support or oppose the statute. Distribute one copy of Master 5.2, *Getting Prepared to Support or Oppose the Statute,* to each student and explain that teams will have 30 minutes to study resources that will help them answer their questions about the statute and identify the key reasons to support or oppose it.**

   We recommend you assign teams to pro and con positions to assure a good balance of viewpoints during the upcoming hearing (Step 6). If students complain that they do not want to identify reasons to support a position they do not hold, explain that being able to understand and argue for positions other than their own is an important skill and will help them better understand their own position.

   Students should watch the videos on the CD-ROM (*A Proposed Statute* and *The People Respond*) and use resources in the CD-ROM-based Reference Database to help them develop their lists of reasons.

   Give the teams 30 minutes to complete their research. Reasons that students may identify include those in Figure 18. Emphasize that wherever possible, students should offer evidence in support of their reasons. For example, the statement that skin cancer is the most common type of cancer in the United States would be strengthened by citing statistics (available in the reference database) about the incidence of skin cancer.

4. **Direct the teams to identify their three strongest reasons in support of or against the statute and to designate a spokesperson to articulate those reasons.**

   Give the teams 5 minutes to complete this task.

5. **Announce that the hearing is about to begin and explain that at the end of the hearing, the class will vote on whether to recommend the statute for enactment. Emphasize that students are not required to vote for the position they were assigned to research. Instead, students should listen carefully to the discussion and decide how they will vote based on the strength of the reasons that are presented.**

6. **Begin the hearing by inviting one team that was assigned to identify reasons in support of the statute to present its position. Then, ask a team that was assigned to oppose the statute to present its position. Follow this pattern until all teams have presented their positions, then open the floor to comments and questions raised by other students.**

Science plays an important role in helping legislators make decisions about laws related to personal and public health. For example, as illustrated in this activity, science provides evidence that can be used to support or oppose laws protecting people from exposure to harmful agents. Ask students to name other examples where science has helped lawmakers act in ways that protect personal and public health (for example, mandatory vaccination programs and laws regulating toxic chemical use).

Figure 18 Reasons to Support or Oppose the Statute

To Support the Statute	To Oppose the Statute
Skin cancer is the most common type of cancer in the United States. Protection of the type described likely would reduce the incidence of UV damage that can lead to the development of skin cancer. The incidence of melanoma in the United States has more than doubled in 20 years. Skin cancer carries costs for individuals and society. Potential costs include emotional costs, costs associated with the loss of productivity, insurance costs, direct costs for treatment, and costs associated with the loss of life. As the ozone layer continues to deteriorate, the chance of experiencing harmful UV exposure increases. Although most types of skin cancer are easily detected and cured, melanoma is less easily detected in people with heavily pigmented skin and can lead to serious consequences and even death.	The statute unreasonably reduces personal freedom and may even create undue hardship. Although the statute applies to everyone, the risk of skin cancer is not equal for everyone. It is not clear who would enforce the law or what the penalties would be. It is not clear who is responsible for making sure that individuals under the age of 18 comply with the law. There are other ways to reduce the incidence of skin cancer. Skin cancer is easily detected and cured; the money that would be spent to enforce this statute might be better spent on widespread screening programs to detect skin cancer as early as possible.

Instruct students to continue filling in the table on *Getting Prepared* as each team presents its position. In this way, each student develops a list of reasons for and against the statute that he or she can compare prior to the class vote (Step 8).

If a team has no new reasons among its "strongest reasons" to add to the discussion, allow it to add other reasons that have not yet been presented.

7. **When it appears that students have made all the points they are prepared to make, announce that discussion on the issue is about to close. Give students 2 minutes to organize their thoughts and ask questions about any issues that they need clarified.**

8. **Designate one corner of the classroom as the area for opponents of the statute to assemble, and another corner for proponents of the statute to assemble. Ask students to vote by taking a position in the corner that reflects their position on the statute.**

   This "cornering" technique, more dramatic than voting by a show of hands, is a powerful strategy for helping students learn to take a public position on a controversial topic.

9. **Record the results of the class vote on the board.**

10. **Ask the original teams to reconvene to develop written answers to the questions on Master 5.3, *Analyzing the Results of a Public Policy Discussion.***

    Give the teams approximately 5 minutes for this task.

11. **Close the activity by inviting responses to the questions on *Analyzing the Results*.**

    Question 1 What revisions, if any, would you make to the statute in the light of the reasons you heard?

    Answers will vary. Some students may suggest that the percentage covered be reduced to make compliance less onerous and, in cases such as lifeguards, safer. Other students may suggest that certain locations, such as beaches, and certain activities, such as those that require unrestricted movement to be safe, be made exempt from the law. Still others may propose that the law apply only to people located within certain bands of latitude and/or at certain elevations.

    If students have difficulty suggesting reasonable changes, you may wish to ask them questions such as "Is there any way this law could be changed to make it acceptable to you?" or "Can the statute be modified to reduce or eliminate some of its disadvantages while keeping its important benefits?"

    Question 2 What other suggestions can you make about reducing the incidence and impact of skin cancer in the United States?

    Encourage students to think creatively here and to employ all they have learned as a result of completing the activities in this module. You may wish to point out that if they are unhappy with the proposed statute, a positive approach to defeating the measure would be to propose alternate courses of action that would have equal or greater benefits at lower cost. Students may suggest aggressive educational campaigns to alert the public, including children, to the dangers of UV exposure. They also may suggest research to develop more effective sunscreens or materials for canopies at playgrounds and beaches that let warmth and light through but block harmful UV radiation. Other possible suggestions include making annual skin cancer screening mandatory for adults over a certain age, research to develop less expensive and more effective treatment for all types of skin cancer, and even more aggressive research and policy making directed at slowing or reversing the loss of the earth's ozone layer, which is becoming an increasingly important factor in UV exposure in certain parts of the world.

    Question 3 How does this activity illustrate that

    - **good choices can reduce a person's chance of developing cancer?**

Look for evidence that students understand the importance of balancing the need for protection against the value of autonomy in personal decision making. Expect students to recognize that understanding the causes of cancer helps people make decisions about a variety of cancer-related activities, from prevention to reducing risk to detection and treatment.

Questions 3 and 4 on *Analyzing the Results* focus students' attention on the activity's major concepts.

People have many choices available to them that can significantly reduce their chances of developing skin cancer and even can increase their chances of surviving should they develop it. Some of these choices include avoiding being outdoors during hours of peak UV exposure, wearing sunscreen and protective clothing when outdoors at all, practicing regular self-examination to detect unusual changes in the skin, and seeking immediate medical care if any such changes occur.

- **values sometimes conflict in debates about laws related to personal and public health?**

  This activity illustrates the tension between trying to preserve the value of personal and public health and well-being and the value of individual autonomy.

- **it is possible for people to hold different positions on a controversial topic and still participate in a reasoned discussion about it?**

  Students should recognize that the requirement to research their assigned position, provide evidence to support their claims, and offer their ideas in a structured manner helped them discuss this issue in a rich and meaningful way. Some students may say that the discussion did not change how they voted, but most students should recognize that they have a much better understanding of the issues involved as a result of their participation.

Question 4 How has research about cancer helped improve personal and public health in the United States? Answer specifically, using examples drawn from all five of the activities in this module.

Answers will vary.

Potential Extensions

Extend or enrich this activity in the following ways.

- To help students understand how complex policy making can be, suggest that they rewrite the statute in light of the class discussion. The new statute should address the growing problem of skin cancer in a meaningful and effective way, but also should be acceptable to most students in the class.
- Invite interested students to develop, implement, and analyze the results of an informal survey that determines people's understanding or attitudes about skin cancer. Different teams of students may wish to develop quite different instruments. Be sure that students follow established practice by preserving the privacy of the survey participants.